CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
January 3, 2015

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)

CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vacuum truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for January 3, 2015 07:00 to January 4, 2015 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area and along the perimeter of the facility. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with a ProRAE Guardian system at four locations on the fence line of the facility within the work area. Unit 10 was deployed in the cab of an excavator to monitor during waste staging and removal operations. Unit 11 was deployed on the fence line of the facility between the 120 barrel tank truck and the road to monitor Cl_2 concentrations. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, SO_2, and Cl_2. Unit 10 recorded one instantaneous detection of Cl_2 at a concentration of 0.2 ppm. The excavator operator was using an air-purifying respirator (APR) during this period. Unit 11 recorded Cl_2 concentrations up to 6.2 ppm, however CTEH® personnel in the area recorded no Cl_2 detections with handheld instrumentation. Furthermore, field notes indicate the presence of dump trucks in the area around Unit 11, whose exhaust fumes may have caused sensor interference. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE units 01, 02, 03, and 04 and data-logged to monitor PM_{10}. An additional particulate monitor was deployed in the cab of the excavator moving saturated media for waste staging and removal operations. Table 3 summarizes data-logged particulate monitoring data.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
January 3, 2015 07:00 – January 4, 2015 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range[2]
Work Area	Cl_2	Gastec 8La	1	0	NA	<0.05 ppm
		MR+ / MR Pro	15	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	6	0	NA	<1 ppm
	LEL	MR+ / MR Pro	19	0	NA	<1 %
	O_2	MR+ / MR Pro	7	7	20.9	20.9 - 20.9 %
	PM_{10}	AM510/Dusttrak	15	15	0.054	0.011 - 0.145 mg/m^3
	SO_2	MR+ / MR Pro	19	0	NA	<0.1 ppm
	VOC	MR+ / MR Pro	20	2	0.35	0.2 - 0.5 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
January 3, 2015 07:00 – January 4, 2015 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range[2]
Unit 01	H_2S	5462	0	NA	< 1 ppm
	LEL	5462	0	NA	< 1 %
	SO_2	5462	0	NA	< 0.1 ppm
	VOC	5462	0	NA	< 0.1 ppm
Unit 02	H_2S	5421	54	0.2 ppm	0.1 - 0.4 ppm
	LEL	5421	0	NA	< 1 %
	SO_2	5421	0	NA	< 0.1 ppm
	VOC	5421	488	0.1 ppm	0.1 - 0.2 ppm
Unit 03	H_2S	5429	0	NA	< 1 ppm
	LEL	5429	0	NA	< 1 %
	SO_2	5429	0	NA	< 0.1 ppm
	VOC	5429	23	0.1 ppm	0.1 - 0.1 ppm
Unit 04	H_2S	5448	2	0.1 ppm	0.1 - 0.1 ppm
	LEL	5448	0	NA	< 1 %
	SO_2	5448	0	NA	< 0.1 ppm
	VOC	5448	0	NA	< 0.1 ppm
Unit 10	Cl_2	602	1	0.2 ppm	0.2 - 0.2 ppm
	LEL	602	0	NA	< 1 %
	SO_2	602	21	0.1 ppm	0.1 - 0.1 ppm
	VOC	602	36	0.1 ppm	0.1 - 0.1 ppm
Unit 11	Cl_2	5105	103	0.2 ppm	0.1 - 6.2 ppm
	SO_2	5105	0	NA	< 0.1 ppm
	VOC	5105	206	0.1 ppm	0.1 - 1.4 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right*

Table 3: AM510 PM_{10} Monitoring Summary[1]
January 3, 2015 07:00 – January 4, 2015 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	5616	5616	0.021	0.009 - 1.282 mg/m^3
10503020	AR02	5205	5205	0.028	0.009 - 0.292 mg/m^3
10704075	AR03	5127	5127	0.024	0.009 - 0.669 mg/m^3
10704074	AR04	3237	3237	0.025	0.012 - 0.125 mg/m^3
10901027	Excavator 210G (AR10)	639	639	0.022	0.003 - 0.178 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format*

Appendix A

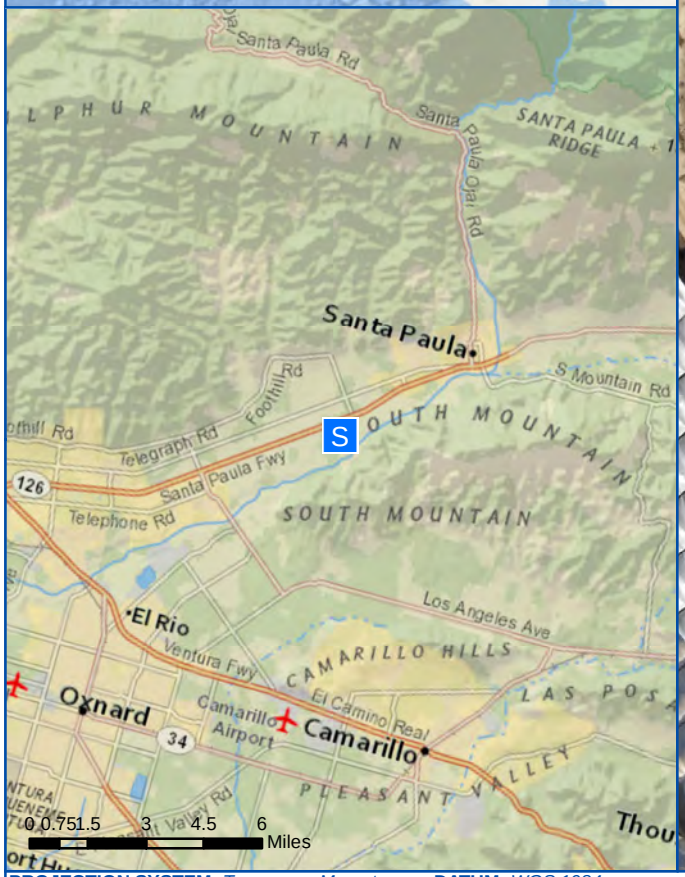
Incident Maps:

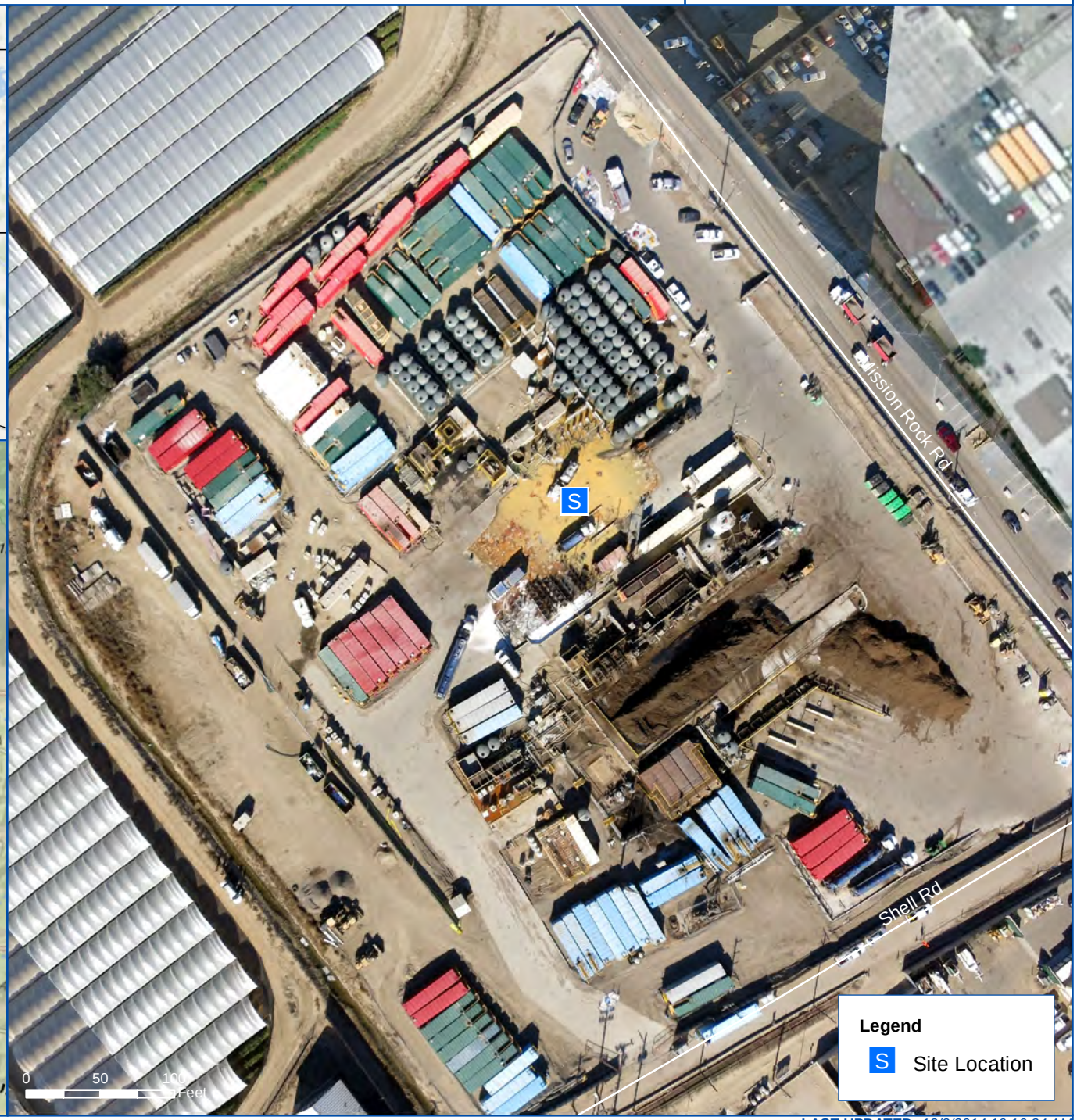
Real-Time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



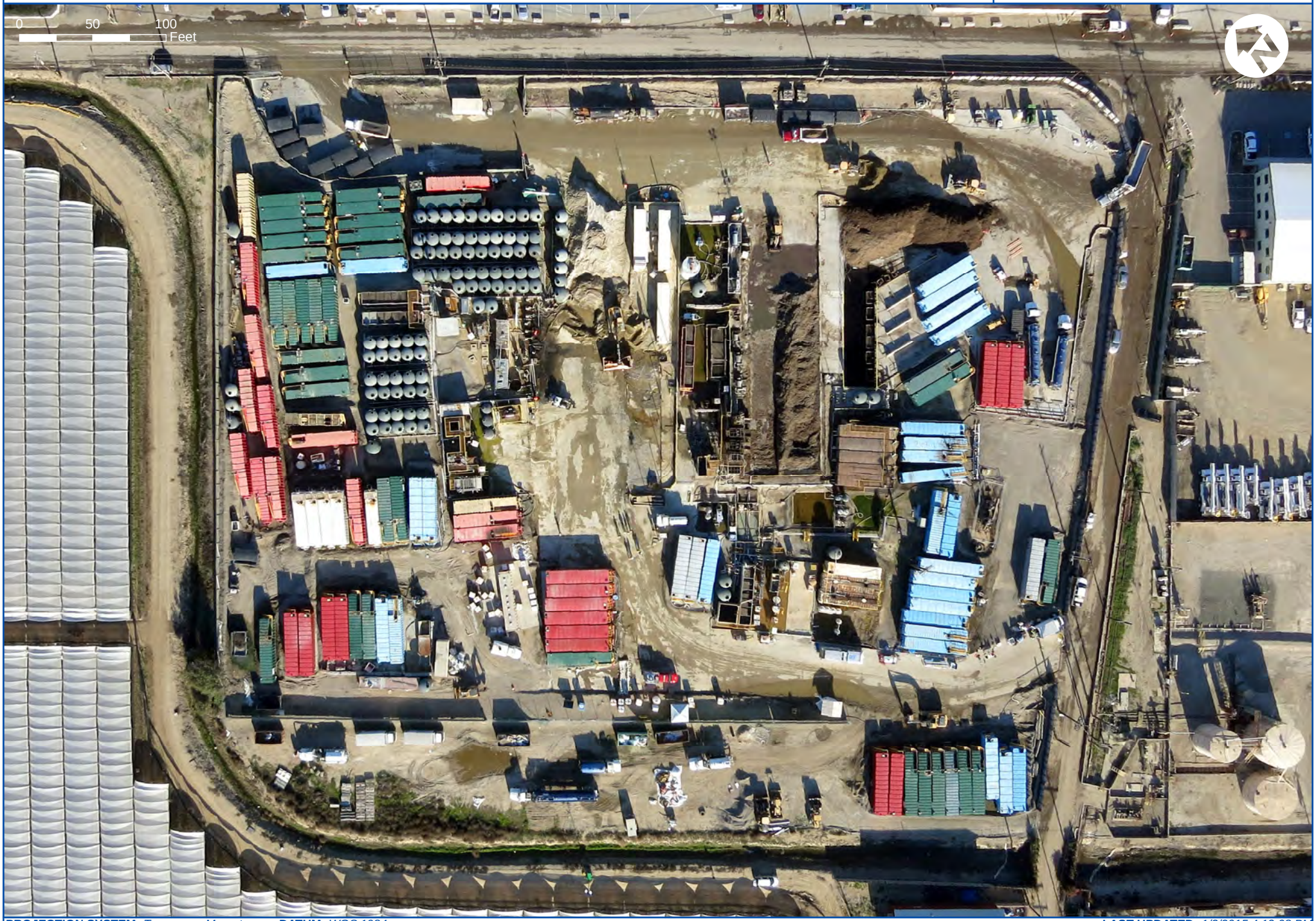


PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/2/2014 10:10:34 AM*

Aerial Overview - 1/03/2015

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *1/3/2015 4:12:08 PM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Jan 03, 2015 07:00 to Jan 04, 2015 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *1/4/2015 7:38:15 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Jan 03, 2015 07:00 to Jan 04, 2015 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *1/4/2015 7:39:23 AM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Jan 03, 2015 07:00 to Jan 04, 2015 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *1/4/2015 7:40:23 AM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Jan 03, 2015 07:00 to Jan 04, 2015 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *1/4/2015 7:41:43 AM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Jan 03, 2015 07:00 to Jan 04, 2015 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *1/4/2015 7:43:46 AM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Jan 03, 2015 07:00 to Jan 04, 2015 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *1/4/2015 7:44:47 AM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Jan 03, 2015 07:00 to Jan 04, 2015 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *1/4/2015 7:48:56 AM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

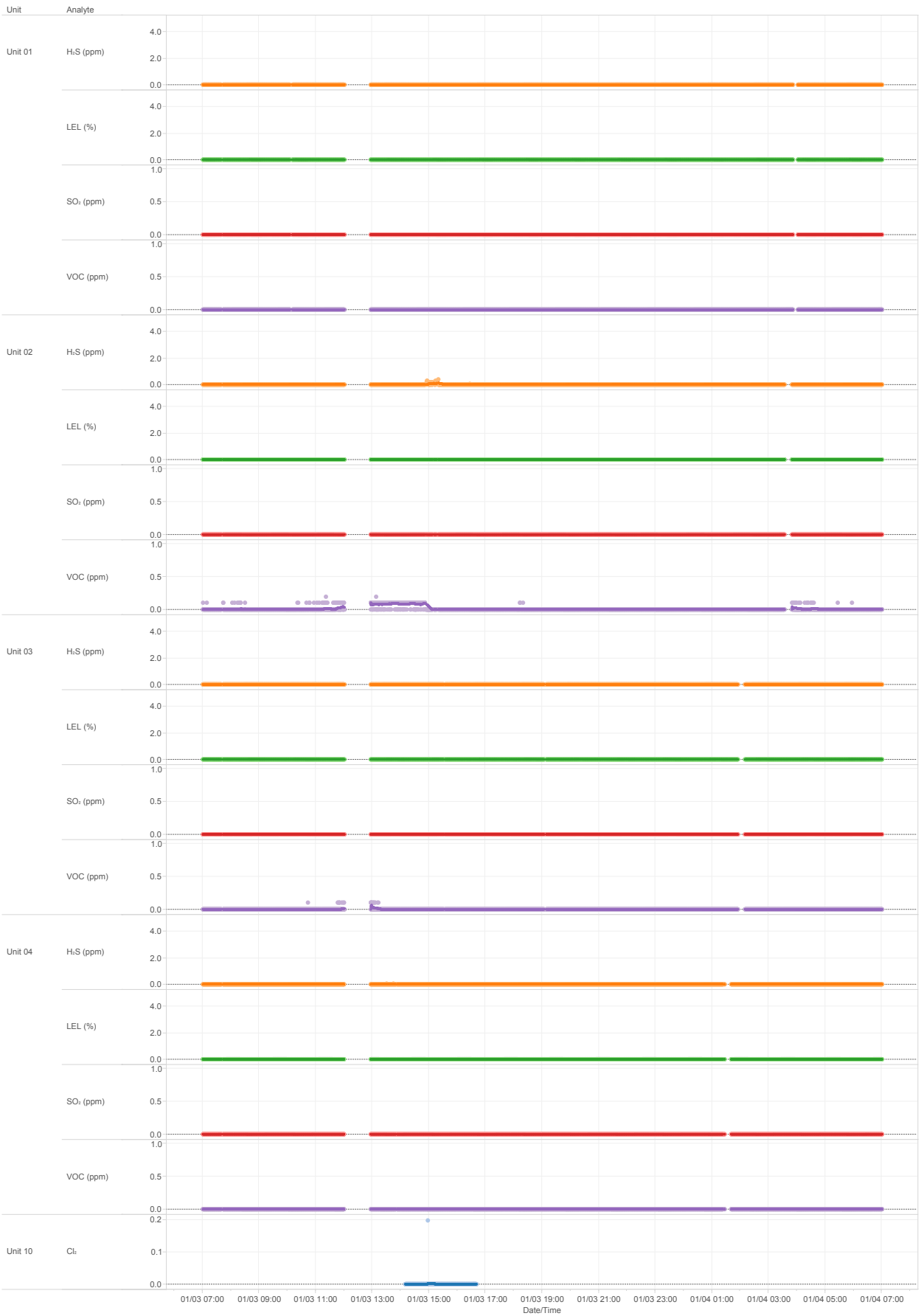
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *1/4/2015 8:59:56 AM*

Patriot Environmental
AreaRAE Trend Graphs
1/03/2015 07:00 - 1/04/2015 07:00

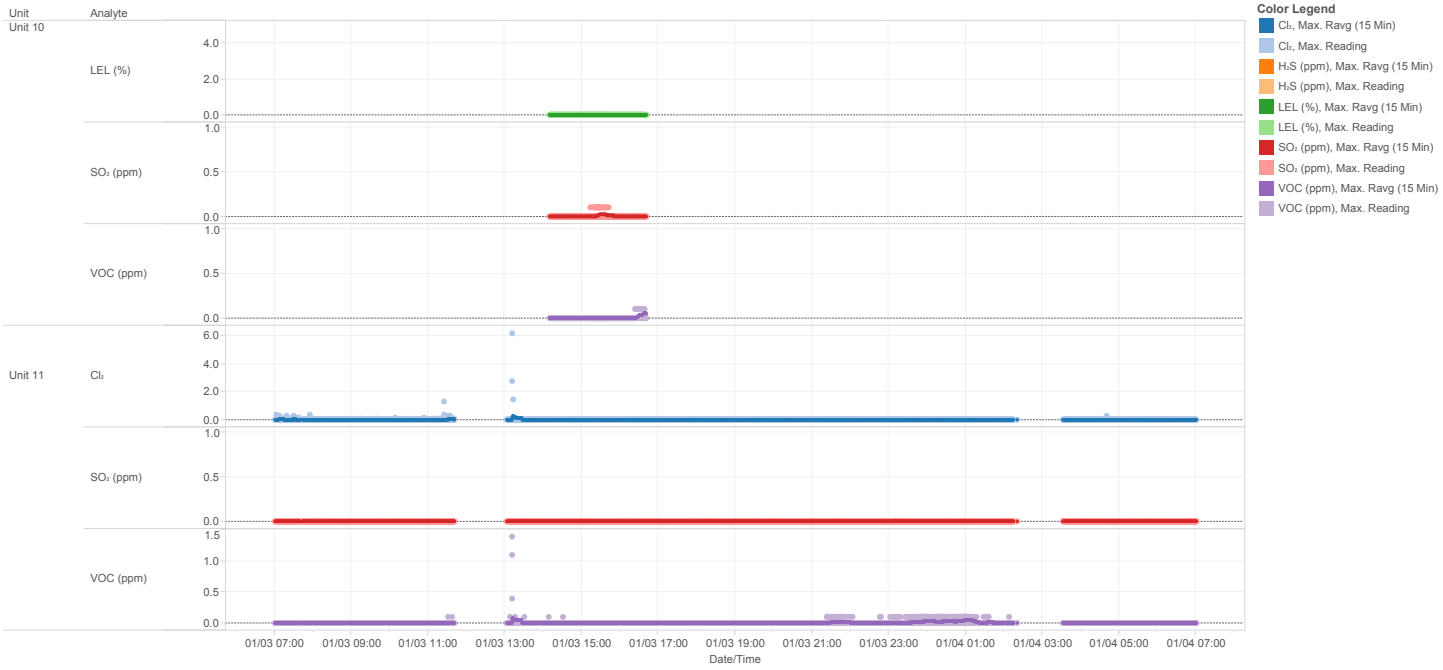


Color Legend

- Cl₂, Max. Ravg (15 Min)
- Cl₂, Max. Reading
- H₂S (ppm), Max. Ravg (15 Min)
- H₂S (ppm), Max. Reading
- LEL (%), Max. Ravg (15 Min)
- LEL (%), Max. Reading
- SO₂ (ppm), Max. Ravg (15 Min)
- SO₂ (ppm), Max. Reading
- VOC (ppm), Max. Ravg (15 Min)
- VOC (ppm), Max. Reading

- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

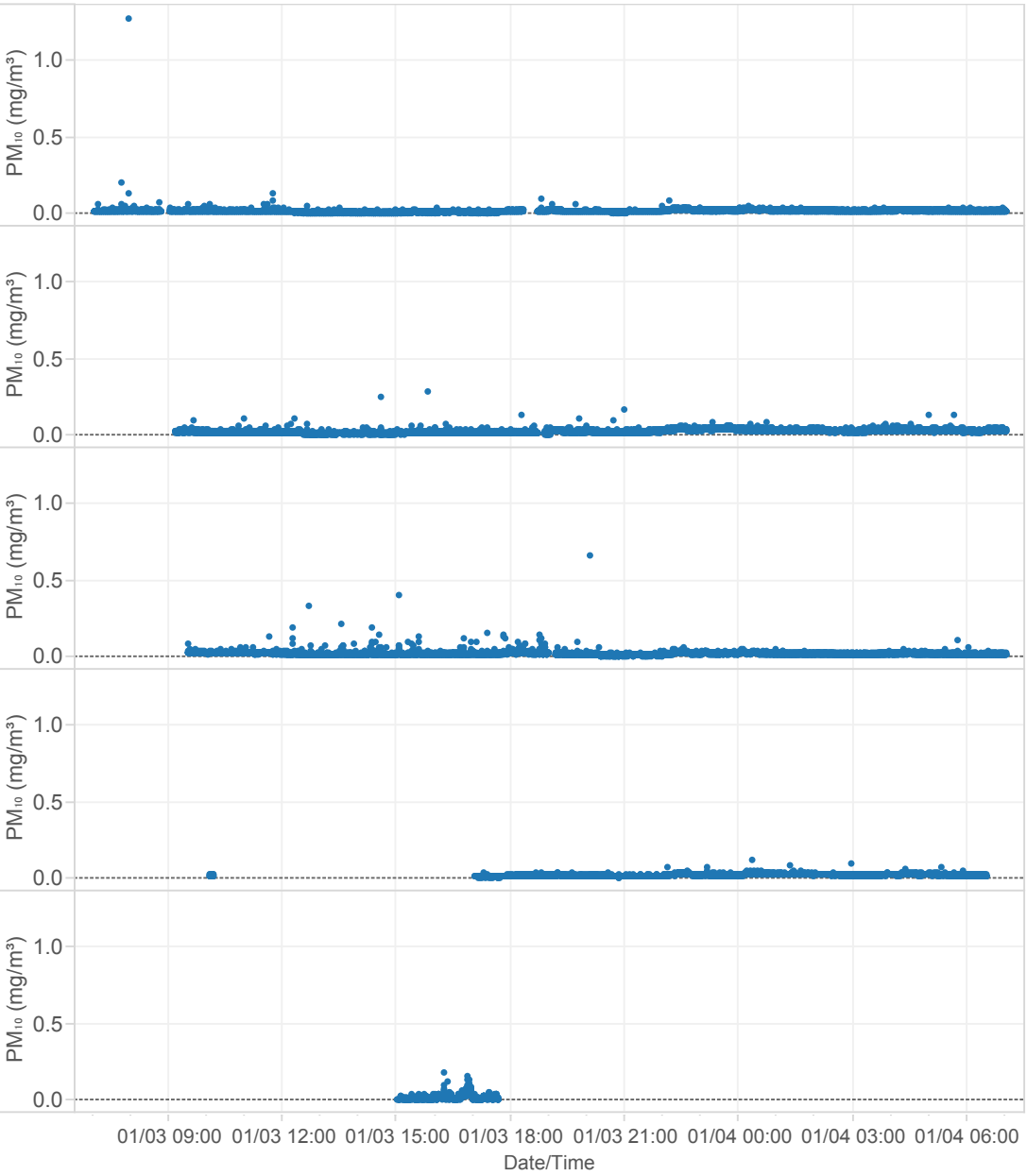
Patriot Environmental
AreaRAE Trend Graphs
1/03/2015 07:00 - 1/04/2015 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
1/03/2015 07:00 - 1/04/2015 07:00

Location	Serial No.
AR01	10601072
AR02	10503020
AR03	10704075
AR04	10704074
Excavator 210G (AR10)	10901027



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